

What is claimed is:

- (1) A method for processing a substance characterized by that the substance is compressed continuously together with carbon dioxide to give a fluid of supercritical or subcritical state and it is extracted, mixed and/or modified wherein the maximum flow rate during processing is 10 to 1500 m/second.
- (2) The method according to Claim 1, wherein a composition containing at least one of polysaccharide and protein as the main ingredient is processed under said critical state and then heated and compressed to give a thermoplastic composition.
- (3) The method according to Claim 2, wherein said composition contains a thermoplastic resin and/or a plasticizer.
- (4) The method according to Claim 2 or 3, wherein said polysaccharide is starch or cellulose and said protein is bean curd lees.
- (5) The method according to any one of Claims 2 to 4, wherein said composition is processed as said fluid of critical state and, after hydrolyzed by heating and compressing, it is dehydratively polycondensed.
- (6) The method according to Claim 5, wherein said composition is prepared by adding at least one compound selected from the group consisting of acids and phenols in an amount of 0.01 to 0.5 weight % to the polysaccharide.
- (7) The method according to Claim 1, wherein an aromatic polyester is processed as a fluid together with a copolymerizing ingredient for making the product lower melting temperature and a branching agent in said critical state to obtain a foam product containing a branched copolymer.
- (8) An equipment characterized in that it is a screw equipment with an orifice wherein a substance is compressed continuously together with carbon dioxide to give a fluid of critical state and it is extracted mixed and/or modified and a maximum flow rate is obtained at the orifice part during processing.
- (9) The equipment according to Claim 8 which is a screw type processing equipment in which a substance is compressed continuously together with carbon

dioxide to be processed as a fluid of critical state, characterized in that next to the extruding screw in the raw material supplying part, a vacuum part in which the shaft of said screw is made thin and the gap volume between the screw blades is increased is provided and carbon dioxide is introduced to the vacuum part, and thereafter the vacuum part, a compressing part in which the shaft is again made thick and the intervals of the blades are made narrow is provided, and then the thickness of the shaft is made to be substantially same as the inner periphery of the barrel, and that an orifice part in which an orifice is provided on the surface or on the surroundings of said shaft is provided.

(10) The equipment according to Claim 9, wherein the maximum flow rate of said substance passing through the orifice is 10 to 1500 cm/seconds.

(11) The equipment according to Claim 9 or 10, wherein said raw material supplying part consists of twin screws, the ratio of the rotation of the main screw to the subscrew being 1:2 and the arrangement of adjacent paddles being not lower than 60 degree and not higher than 180 degree.

(12) The equipment according to Claim 9 or 10 wherein a reversely tapered subscrew is provided next to said orifice part and it is made to be twin screw structure partly.

(13) A thermoplastic composition prepared by the method according to Claim 1, which comprises a polysaccharide and contains cellulose or hemicellulose as one of the main ingredients.

(14) The thermoplastic composition according to Claim 13, containing 0.01 to 3 weight % of mannose ingredient.

(15) The thermoplastic composition according to Claim 13 or 14, containing a biodegradable resin.

(16) The thermoplastic composition according to any one of Claims 13 to 15, wherein at least a part of the biodegradable resin is an aromatic biodegradable resin.

(17) The thermoplastic composition according to any one of Claims 13 to 16, containing at least one plasticizer selected from the group consisting of glycols, glycerols, sorbitol and their mixtures.

(18) The thermoplastic composition according to any one of Claims 15 to 17, wherein the biodegradable resin is used in a ratio of 40 to 90 weight %.

(19) A molding consisting of the thermoplastic composition according to Claims 13 to 18.

(20) A thermoplastic composition consisting of starch, wherein the total amount of nitrogen-containing aromatic components generated and contained in the head space of a 20 ml vial bottle after feeding 10 g of a sample in it and heating it at 180°C for 1 minute is lower than 10 ppm.

(21) The starch composition according to Claim 20, wherein said nitrogen-containing aromatic component is at least one selected from the group consisting of 5-acetyl-2,3-dihydro-1,4-thiazine, 2-acetyl-tetrahydropyridine, 2-propionyl-1-pyrroline, 2-acetyl-1-pyrroline and acetylpyrazine.

(22) The starch composition according to Claim 20 or 21 consisting of a product prepared by a procedure in which at least one compound selected from the group consisting of acids and phenols is added in an amount of 0.01 to 0.5 weight % based on the weight of starch and starch is hydrolyzed and then dehydratively polycondensed.

(23) The starch composition according to any one of Claims 20 to 22, which is blended with a thermoplastic resin.

(24) A molding prepared by using the starch composition according to Claims 20 to 23 as the main raw material.

(25) A bean curd lees composition molding consisting of a composition using a thermoplastic resin and bean curd lees as the main raw materials, wherein the total amount of hexanal and hexanol generated and contained in the head space after feeding 5 g of a sample in 20 ml vial bottle and heating it at 180°C for 1 minute is lower than 5 ppm.

(26) The bean curd lees composition molding according to Claim 25, wherein the thermoplastic resin is at least one selected from the group consisting of polyolefin resin, polystyrene resin, polyamide resin, polyester resin and polyurethane resin.

(27) The bean curd lees composition molding according to Claim 25 or 26.

wherein the thermoplastic resin is a biodegradable resin.

(28) A branched polyester copolymer molding, which is prepared by reacting (A) polyethylene terephthalate with (B) an aliphatic dialcohol and an aliphatic dicarboxylic acid having a carbon number of 1 to 4 and/or hydroxy-carboxylic acid or their polymers in the presence of a branching agent and which has a melting point peak temperature of 120 to 190°C.

(29) The polyester molding according to Claim 28, wherein 5 to 50 parts by weight of the ingredient (B) is mixed with 100 parts by weight of the ingredient (A) for use.

(30) The polyester molding according to Claim 28 or 29, wherein said molding is a gas foamed product having an expansion ratio of 4 to 50.

(31) A polyester foamed molding which is prepared by reacting (A) an aromatic polyester with (B) an aliphatic dialcohol and an aliphatic dicarboxylic acid having carbon number of 1 to 4 and/or hydroxy-dicarboxylic acid or their polymers in the presence of a branching agent and which has a melting point peak temperature of 150 to 195°C and which is foamed in the presence of photocatalytic titanium dioxide and a thermodegradable foaming agent.

(32) The foamed molding according to Claim 31, wherein the aromatic polyester (A) is polyethylene terephthalate or polybutylene terephthalate.

(33) The foamed molding according to Claim 31 or 32, wherein said molding is an injection molded product, beads or an extruded molding.

(34) A branched polyester elastomer consisting of a hard segment and a soft segment prepared by the method according to Claim 1 and its foamed molding.

(35) A capsule, a wafer, a thickener and a gelled product consisting of a composition according to any one of Claims 13 to 18 and 20 to 23.

(36) The edible capsule, the wafer, the thickener and the gelled product according to Claim 35, which is for drugs or foodstuffs.